



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/729,838	12/05/2003	Walter D. Micher	KLAIP117/PI151	8320
61736	7590	09/26/2006	EXAMINER	
BEYER WEAVER & THONAS LLP			STOCK JR, GORDON J	
P.O. BOX 70250			ART UNIT	
OAKLAND, CA 94612			PAPER NUMBER	
			2877	

DATE MAILED: 09/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.	Applicant(s)	
10/729,838	MIEHER ET AL.	
Examiner	Art Unit	
Gordon J. Stock	2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-111 is/are pending in the application.
- 4a) Of the above claim(s) See Continuation Sheet is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14, 19, 24-26, 32-35, 40-42, 46-48, 53, 54, 57-69, 74, 79-81, 95-97, 101, 108 and 111 is/are rejected.
- 7) ☒ Claim(s) 87-90 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 December 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>20050516;20041108;20040816</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Species 8 (claims 11-14, 19, 24-26, 32-35, 48, 66-69, 74, 79-81, and 87-90 with generic claims 1-10, 40-42, 46, 53, 54, 57-65, 95-97, 101, 108 and 111) in the reply filed on June 19, 2006 is acknowledged. Examiner would like to note that Applicant elected **claim 48** depending upon a nongeneric and nonelected **claim 47**; however, Examiner will treat **claim 47** on its merits.

2. Claims 15-18, 20-23, 27-31, 36-39, 43-45, 49-52, 55, 56, 70-73, 75-78, 82-86, 91-94, 98-100, 102-107, 109, and 110 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on June 19, 2006.

Information Disclosure Statement

3. The information disclosure statement (IDS) submitted on May 26, 2005; November 8, 2004; and August 16, 2004 have been considered by the examiner.

Drawings and Specification

4. The specification is objected to for the following: on page 42 line 7 'modulation device 532' should read –modulation device 552-; on page 43 line 9 'mirror 574' should read –mirror 572-; on page 74 lines 4 and 6 'targets 1008' should read –targets 1008a-1008d-; on page 79 line 10 '152' should read -1152-; on page 82 line 7 the U.S. Provisional Application No. needs to be updated; on page 85 lines 8 and 13 '116' should read –1166-. Corrections required.

5. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: **T2** of Fig. 2a..

Art Unit: 2877

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

6. The drawings and specification are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: **OVL** of Fig. 3b; **502, 503, 504, 505, 506, 508, 509, 510, 512, 514, and 524** of Fig. 5a; **704** of Fig. 7; **1184** and **1188** of Fig. 11f. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Art Unit: 2877

7. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 101

8. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

9. **Claims 1-14, 19, 24-26, 32-35, 40-42, 46, 48, 53, and 54** are rejected under 35

U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. In **claim 1** the step of determining overlay error ... using a linear approximation is an abstraction without a tangible result. **Claims 2-14, 19, 24-26, 32-35, 40-42, 46, 48, 53 and 54** are rejected for depending upon a rejected base claim; wherein **claims 2-14, 19, 24-26, 32-35, 40-42, 46, 48, 53 and 54** further limiting of the parent claim still does not have a tangible result. Merely ‘determining overlay error ... using a linear approximation’ would not appear to be sufficient to constitute a tangible result, since the outcome of the ‘determining’ has not been used in a disclosed practical application nor made available in such a manner that its usefulness in a disclosed practical application can be realized. See OG Notices: 22 November 2005, "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility". Specifically: Part b. *Practical Application the Produces a Useful, Concrete, and Tangible Result* under Section IV *Determine Whether the Claimed Invention Complies with the Subject Matter Eligibility Requirement of 35 U.S.C. Sec. 101*, sentence 3, in the OG Notice from 22 November 2005 states ‘In determining whether the claim is for a “practical application,” the focus is not on

Art Unit: 2877

whether the steps taken to achieve a particular result are useful, tangible, and concrete, but rather that the final result achieved by the claimed invention is “useful, tangible, and concrete.”

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11. **Claims 1-14, 19, 26, 40-42, 46, 57-69, 74, 81, 95, 96, 97, and 101** are rejected under 35 U.S.C. 102(e) as being anticipated by **Yang et al. (6,982,793)**.

As for **claims 1 and 57**, Yang in a method and apparatus for using an alignment target with designed in offset discloses the following: providing targets A, B, C, D that each include a portion of the first and second structures on a first and second layer of a sample (Fig. 15: 252, 254, 256, 258); wherein the target A (Fig. 15: 252) is designed to have an offset X_a , D, between its first and second structures portions (Fig. 15: 252, D); wherein the target B (Fig. 15: 254) is designed to have an offset X_b , -D, between its first and second structures portions (Fig. 15: 254, -D); wherein the target C (Fig. 15: 256) is designed to have an offset X_c , D + d, between its first and second structures portions (Fig. 15: 256, D + d); wherein the target D, (Fig. 15: 258) is designed to have an offset X_d , -D-d, between its first and second structures portions (Fig. 15: 258, -D-d); wherein each offsets X_a , X_b , X_c , and X_d is different from zero (Fig. 15: D, -D, D+d, -D-d are not zero); X_a , D, is an opposite sign and differ from X_b , -D (Fig. 15: D from the mirror image of -D); X_c , D+d, is an opposite sign and differs from X_d , -D-d (Fig. 15: D+d from the

Art Unit: 2877

mirror image of $-D-d$); illuminating the targets A, B, C, and D with EM radiation to obtain spectra Sa, Sb, Sc, and Sd from targets A-D respectively (col. 16, lines 38-40; Fig. 12a-12c: 122, 141, and 146 respectively); determining any overlay error between the first structures and the second structures using linear approximation based on the obtained spectra (Fig. 16: equation 8; col. 16, lines 40-50); a scatterometry module for illuminating the targets (Fig. 12c: 145; col. 11, lines 50-55); a processor operable for determining any overlay error (Fig. 12c: 147 and 148).

As for **claims 2 and 58**, Yang discloses everything as above (see **claims 1 and 57**). In addition, he discloses determining a difference spectrum D1, R1-R2, from the spectra Sa and Sb (col. 16, lines 40-45; Fig. 16); determining a difference spectrum D2, R3-R4, from the spectra Sc and Sd (col. 16, lines 40-45; Fig. 16); determining any overlay error by performing a linear approximation based on the difference spectra D1 and D2 (col. 16, lines 40-45; equation 8).

As for **claims 3 and 59**, Yang discloses everything as above (see **claims 2 and 58**). In addition, he discloses the linear approximation is based on a property P1, reflectance intensity, of the difference spectrum D1 and a property P2, reflectance intensity, of the difference spectrum D2 (Fig. 16; col. 16, lines 40-45).

As for **claim 4**, Yang discloses everything as above (see **claim 1**); wherein each target comprising a grating structure Ga1 having a periodic structures with a period Ta1 disposed at least partially within the first layer and a grating structure Ga2 having a periodic structure with a period Ta2 disposed at least partially within the second layer, wherein Ta1 and Ta2 are substantially identical (col. 16, lines 1-25; col. 8, lines 65-67; col. 9, lines 1-15); wherein, the offsets are each produced by offsetting the structures with the period Ta1 with respect to the period Ta2 by the sum of the a first distance, D, and a second distance, 0 or d, wherein the

Art Unit: 2877

second distance has a smaller absolute value than the first distance, 0 or d is smaller than D (Fig. 16: 252: $D + 0$; 254: $-D + 0$; 256: $D + d$; 258: $-D - d$; col. 8, lines 55-65; col. 16, lines 20-35).

As for **claims 5-8 and 60-63**, Yang discloses everything as above (see **claims 1 and 57**). In addition, he discloses that the four targets, A-D, may be disposed along a substantially straight line (col. 8, lines 40-55 with Fig. 15: 252-258 and Fig. 35: 1502); wherein, target B is disposed between the target A and the target C, and the target C is disposed between the target B and the target D (suggested in col. 8, line 40-55 with Fig. 35: 1502); are disposed in a two dimensional configuration and the targets A and B are disposed along a first axis, the targets C and D are disposed along a second axis, and the first axis and the second axis (both x directions) are substantially parallel (col. 8, lines 40-55 with Fig. 15: 252-258).

As for **claims 9 and 64**, Yang discloses everything as above (see **claims 1 and 57**). In addition, he discloses producing an additional target E, the additional target E including a portion of the first and second structures (Fig. 35: 1502) with an offset Y there between (with Figs. 25a-25b); illuminating the additional target E with EM to obtain spectra and determining any overlay error further based on the spectrum S_e (col. 17, lines 30-45 with Figs. 12a-12c).

As for **claims 10-14 and 65-69**, Yang discloses everything as above (see **claims 1 and 57**). In addition, he discloses the following: using an optical apparatus (Figs. 12a-12c; col. 11, lines 50-55) which may be an imaging reflectometer (Fig. 26a; col. 13, lines 14-20); an imaging spectroscopic reflectometer (Fig. 26a: col. 13, lines 10-20); a polarized spectroscopic imaging reflectometer (Figs. 12a and 12c are polarized spectroscopic reflectometers for single target inspection; with imaging of simultaneous targets accomplished by adding an imaging

spectrometer grating and CCD detector in Fig. 26a: reflectometric system); scanning reflectometer system (Fig. 12c: demonstrating angular scanning).

As for **claims 19 and 74**, Yang discloses everything as above (see **claims 10 and 65**). In addition, he discloses an imaging spectrometer (Fig. 26a; col. 13, lines 10-20).

As for **claims 26 and 81**, Yang discloses everything as above (see **claims 10 and 65**). In addition, he discloses a scanning ellipsometer system (Fig. 12b: demonstrating angular scanning).

As for **claims 40-42 and 95-97**, Yang discloses everything as above (see **claims 1, 3, 57 and 59**). In addition, he discloses that the spectra comprises EM radiation that is selectively polarized or selectively polarized (Figs. 12a-12c; col. 12, lines 10-20); wherein, the spectra comprises EM radiation that is unpolarized reflected light (Fig. 26a) or polarized with the electric field at an angle with respect to a symmetry axis of at least one set of structures (Figs. 12a-12c); wherein, the properties P1 and P2 of the difference spectra are selected from spectral characteristics and intensity (Fig. 16; col. 16, lines 40-67).

As for **claims 46 and 101**, Yang discloses everything as above (see **claims 3 and 59**). In addition, he discloses determining properties P1 and P2 comprises obtaining characteristics of the difference spectra: the intensity of reflectance (Fig. 16: col. 16, lines 40-67).

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

14. **Claims 24, 25, 47, 48, 79, and 80** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Yang et al. (6,982,793)**.

As for **claims 24, 25, 79, and 80**, Yang discloses everything as above (see **claims 10 and 65**). In addition, he discloses a spectroscopic ellipsometer (Fig. 12b). He is silent concerning an imaging spectroscopic ellipsometer. However, he discloses imaging with a grating and CCD to simultaneously inspect two targets (Fig. 26a: col. 13, lines 10-20). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to have an imaging spectroscopic ellipsometer in order to simultaneously inspect several overlay targets for rapid misregistration analysis.

As for **claim 47**, Yang discloses everything as above (see **claim 19**). In addition, he discloses illumination and a lens (Fig. 26a: 804 and 810). He does not explicitly state the illumination and the numerical aperture of the lens are chosen to optimize instrument performance by ensuring that only zeroth diffraction order is collected. However, the system is a normal incidence reflectometer (Fig. 26a: illuminating normal to the plane of the target), and Yang discloses normal incidence and detection of diffracting light reflected from target (col. 12,

Art Unit: 2877

lines 5-30). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to have the lens numerical aperture and the illumination at an optimal value to ensure that the normal incidence reflectometer system captures solely the zeroth order diffracted light, light reflecting off of the surface normal to incident surface, for greater signal to noise from eliminating non-normal reflected, higher order diffraction orders, from entering the detector.

As for **claim 48**, Yang discloses everything as above (see **claim 47**). In addition, he discloses a spectroscopic ellipsometer (Fig. 12b). He is silent concerning an imaging spectroscopic ellipsometer. However, he discloses imaging with a grating and CCD to simultaneously inspect two targets (Fig. 26a: col. 13, lines 10-20). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to have an imaging spectroscopic ellipsometer in order to simultaneously inspect several overlay targets for rapid misregistration analysis.

15. **Claims 53, 54, 108, and 111** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Yang et al. (6,982,793)** in view of **Sezginer et al. (6,819,426)**.

As for **claims 53, 54, and 108**, Yang discloses everything as above (see **claims 1 and 57**). In addition, he discloses that the spectra are images (Fig. 26a; col. 13, lines 10-20). He does not explicitly state an imaging overlay metrology type target and measuring a second overlay error of the imaging overlay metrology type target and using the spectra of the four targets with the imaging overlay metrology type target to perform overlay error measurement. However, Sezginer in an overlay alignment metrology using diffraction gratings teaches using an additional target, an imaging overlay metrology type target, and using both spectroscopic

Art Unit: 2877

measurements, fine overlay, with the gross overlay to remove any ambiguity in the overlay measurements (col. 14, lines 48-47 and col. 15, lines 1-10). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to have an additional target, an imaging overlay metrology type target, and to use both the imaging overlay metrology measurement, gross overlay, with fine overlay, using spectra, in order to remove any ambiguity in case there is gross overlay over half the pitch of the gratings.

As for **claim 111**, Yang discloses the following: Yang in a method and apparatus for using an alignment target with designed in offset discloses the following: providing targets A, B, C, D that each include a portion of the first and second structures on a first and second layer of a sample (Fig. 15: 252, 254, 256, 258); wherein the target A (Fig. 15: 252) is designed to have an offset X_a , D , between its first and second structures portions (Fig. 15: 252, D); wherein the target B (Fig. 15: 254) is designed to have an offset X_b , $-D$, between its first and second structures portions (Fig. 15: 254, $-D$); wherein the target C (Fig. 15: 256) is designed to have an offset X_c , $D + d$, between its first and second structures portions (Fig. 15: 256, $D + d$); wherein the target D, (Fig. 15: 258) is designed to have an offset X_d , $-D - d$, between its first and second structures portions (Fig. 15: 258, $-D - d$); wherein each offsets X_a , X_b , X_c , and X_d is different from zero (Fig. 15: D , $-D$, $D + d$, $-D - d$ are not zero); X_a , D , is an opposite sign and differ from X_b , $-D$ (Fig. 15: D from the mirror image of $-D$); X_c , $D + d$, is an opposite sign and differs from X_d , $-D - d$ (Fig. 15: $D + d$ from the mirror image of $-D - d$); illuminating the targets A, B, C, and D with EM radiation to obtain spectra S_a , S_b , S_c , and S_d from targets A-D respectively (col. 16, lines 38-40; Fig. 12a-12c: 122, 141, and 146 respectively); determining any overlay error between the first structures and the second structures using linear approximation based on the obtained spectra

Art Unit: 2877

(Fig. 16: equation 8; col. 16, lines 40-50). He does not explicitly state an imaging overlay metrology type target and measuring a second overlay error of the imaging overlay metrology type target. However, Sezginer in an overlay alignment metrology using diffraction gratings teaches using an additional target, an imaging overlay metrology type target, and using both spectroscopic measurements, fine overlay, with the gross overlay to remove any ambiguity in the overlay measurements (col. 14, lines 48-47 and col. 15, lines 1-10). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to have an additional target, an imaging overlay metrology type target, and to use both the imaging overlay metrology measurement, gross overlay, with fine overlay, using spectra, in order to remove any ambiguity in case there is gross overlay over half the pitch of the gratings.

Allowable Subject Matter

16. **Claims 87-90** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 32-35 would be allowable if rewritten to overcome the rejection under 35 U.S.C. 101 including all of the limitations of the base claim and any intervening claims.

As to **claims 32-35 and 87-90**, the prior art of record, taken alone or in combination, fails to disclose or render obvious a method/system for determining overlay the optical apparatus comprising both an ellipsometer and a reflectometer, in combination with the rest of the limitations of **claims 32-35 and 87-90**.

Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure: US 2004/0129900 to Den Boef et al.

U.S. Patent 6,949,462 to Yang et al.

U.S. Patent 6,992,764 to Yang et al.

U.S. Patent 7,061,615 to Lowe-Webb

The following are citations from IDS of May 16, 2005 that were crossed out by Examiner. The Examiner has corrected the pertinent pages of each publication:

TDB, "Mask Overlay Determination," IBM Technical Disclosure Bulletin, December 1978, pp. 2772-2773. www.delphion.com

Kim, Young-Chang et al., "Automatic In-Situ Focus Monitor Using Line Shortening Effect," Journal: Proceedings of the SPIE, vol. 3677, pt. 1-2, pp. 184-193.

Sherman, Enrique R., "Characterization and Monitoring of Variable NA and Variable Coherence Capable Photo Steppers Utilizing the Phase Shift Focus Monitor Reticle," Journal: Proceedings of the SPIE, vol. 2439, pp. 61-69.

Bischoff, Jorg et al., "Modeling of Optical Scatterometry with Finite-Number-of-Periods Grating," Journal: Proceedings of the SPIE, vol. 3743, pp. 41-48.

Baumbach, T. et al., "Grazing Incidence Diffraction by Laterally Patterned Semiconductor Nanostructures," Journal: Journal of Physics, vol. 32, no. 6, pp. 726-740.

Uchida, Norio et al., "A Mask to Wafer Alignment and Gap Setting Method for X-Ray Lithography Using Gratings," Journal: Journal of Vacuum Science & Technology B, vol. 9, no. 6, pp. 3202-3206.

Art Unit: 2877

Ina, Hidecki et al., "Alignment Mark Optimization to Reduce Tool and Wafer-induced Shift for XTRA-1000," Japanese Journal of Applied Physics, vol. 38, no. 12B, pp. 7065-7070.

Fax/Telephone Numbers

If the applicant wishes to send a fax dealing with either a proposed amendment or a discussion with a phone interview, then the fax should:

1) Contain either a statement "DRAFT" or "PROPOSED AMENDMENT" on the fax cover sheet; and

2) Should be unsigned by the attorney or agent.

This will ensure that it will not be entered into the case and will be forwarded to the examiner as quickly as possible.

Papers related to the application may be submitted to Group 2800 by Fax transmission. Papers should be faxed to Group 2800 via the PTO Fax machine located in Crystal Plaza 4. The form of such papers must conform to the notice published in the Official Gazette, 1096 OG 30. (November 15, 1989). The CP4 Fax Machine number is: (571) 273-8300

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gordon J. Stock whose telephone number is (571) 272-2431.

The examiner can normally be reached on Monday-Friday, 10:00 a.m. - 6:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr., can be reached at 571-272-2800 ext 77.

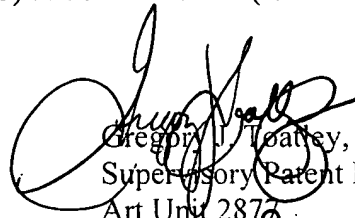
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

Art Unit: 2877

system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private Pair system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


gs

September 16, 2006


Gregory J. Toatney, Jr.
Supervisory Patent Examiner
Art Unit 2877
18 Sept 06

Continuation of Disposition of Claims: Claims withdrawn from consideration are 15-18,20-23,27-31,36-39,43-45,49-52,55,56,70-73,75-78,82-86,91-94,98-100,102-107,109 and 110.